

REMARKS

Review and reconsideration of the Office Action of September 22, 2004 are respectfully requested in view of the above amendments and the following remarks.

Present Invention

In dangerous traffic situations where speedy reaction is required, the vehicle operator may not be able to interpret many different dashboard displays such as lights, graphs, etc. and quickly integrate the information into useful understanding of the actual traffic situation.

Heads-up-displays are known, but this mainly involves moving information from the dashboard to the field of view of the operator. The fact remains that important information is presented in the form of numeric, graphical, and symbolic representations which must be interpreted and applied to the context of the traffic situation. The time it takes to comprehend and apply such information can be critical in emergency situations.

The present invention provides information in greatly simplified, intuitively easy to grasp form, so that the vehicle operator's situation awareness is quickly updated. More specifically, important environmental and operating parameters, such as traffic jams or road information, are provided integrated into a single three-dimensional virtual scene as viewed from the perspective of the vehicle operator. By

providing more information in 3-D form rather than 2-D form, the traffic situation becomes easier to quickly assimilate.

According to the present claims, traffic information is displayed (on the dashboard or windshield) according to a process comprising:

generating a virtual display representing the operating environment of the vehicle from the perspective view of an occupant of the vehicle,

displaying within the virtual display an image element (4A through 4H) as a **three dimensional image**,

changing at least one characteristic of the image element (4A through 4H) depending at least one of:

- the roadway ahead (F),
- an operating parameter of the vehicle, and
- a parameter of an object (6) identified in the area of the vehicle preceding roadway (F),

wherein said display includes at least one **three dimensional image element** representing an operating parameter or providing warning information.

Office Action

Turning now to the Office Action in greater detail, the paragraphing of the Examiner is adopted.

The Examiner, in essence, notes that there are two claims numbered 46. The Examiner rennumbers the second claim 46 as claim 47, and rennumbers my claims 47-49 as 48-50.

Claim Rejections - 35 USC § 102

Claims 27-29, 34, 36-38, 43-47 and 49 are rejected under 35 U.S.C. §102(b) as being anticipated by Hoehn (U.S. Patent No. 5,519,536 = DE43 19 904 A1).

Applicants respectfully traverse.

An "anticipation" rejection requires that every element recited in the claim be found in the reference.

The present claims require not merely that the overall display be three dimensional (i.e., made up of positioned 2-D images as in Hoehn), but rather that the **symbols (image element within the virtual display (4A through 4H) operating parameter or providing warning information) be presented in 3-D.**

Hoehn has no appreciation that by presenting this information with three dimensional image elements, comprehension speed is boosted and vehicle safety is dramatically improved.

Certainly, according to one example of Hoehn, as a preceding vehicle comes closer and the level of danger increases, a symbol of a car is displayed on the windshield of the own vehicle. The symbol increases gradually in size or intensity depending upon the closeness of the preceding vehicle and the needed intensity of warning. However, this presentation is in two dimensions, which still requires interpretation and application to the traffic situation.

According to Hoehn col. 2, lines 31-46, a **further** display (19) may be superimposed on the first display "so that a **virtual image** can be composed of these two displays. The first display could be a car warning symbol and the second display could be a travel path with a distance scale (e.g., 50-200 meters). As

the real cars come closer together, the virtual car moves on the distance scale and changes in size. See also Fig. 4 and associated text, and claim 1.

Applicants respectfully argue against the rejection in that:

- (a) the scale projected on the windshield, which the Examiner compares to the present virtual environment, is not a virtual display representing the operating environment of the vehicle from the perspective view of an occupant of the vehicle,
- (b) the virtual display of an image element (4A through 4H) is not in the form of a three dimensional image, and
- (c) operating information such as distance or speed is not presented in **three dimensional** form.

In contrast to Hoehn, in the present invention, as illustrated in the present figures:

- (a) the virtual display **represents the operating environment** (road curves, changes in elevation, intersections, etc are shown - see specification, paragraph 00010), and
- (b) **symbols** representing the operating environment such as road signs and preceding vehicles, are shown **three dimensional**, and
- (c) **symbols** providing operating parameters such as distance or speed, and warning information, are shown **three dimensional** (i.e., according to the

present specification, paragraph 00009 "the image element is represented with shading, masking, perspective, vertical position in the image, as would be observed in the actual field of view of the occupant").

This improved representation makes it easier for the vehicle operator to grasp the current situation and react more quickly in an emergency situation than he could if he had to interpret the display of Hoehn.

Applicants note that the Examiner did not reject claim 30 (contour of the roadway (F) is continuously conformed to the natural course of the stretch of road ahead of the vehicle) under this paragraph. Applicants incorporate the limitations of claim 30 into claims 27 and 44, thereby clearly overcoming the anticipation rejection with respect to the process and device claims.

Claim Rejections - 35 USC § 103

The Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Claims 30-33, 35, 42, 48 and 50 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hoehn (U.S. Patent No. 5,519,536) as applied to claims 27 and 44 above, and further in view of Nojima et al. (U.S. Patent No. 5,764,139).

The Examiner cites Nojima et al for teaching that the display be continuously conformed to the natural course or stretch of road ahead of the vehicle.

However, see also col. 7, lines 20 on of Nojima et al: "Note that three-dimensional image data is supplied from the navigation system. As described, while the same items of information are displayed, the display areas and the amounts of information are varied sequentially according to running conditions, in other word, the display screen changes according to running conditions to enable the driver to easily see and understand the display screen and obtain needed information."

It does not appear that symbology is represented in Nojima et al in three dimensional form. Speed or distance is not shown three dimensionally.

Withdrawal of the rejection is respectfully requested.

Next, claims 39 and 40 (acoustic or optical signal) are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoehn (U.S. Patent No. 5,519,536) as applied to claim 27 above, and further in view of Dobler et al. (U.S. Patent No. 6,038,496).

Applicants submit that these claims are allowable by virtue of their dependency from allowable main claims.

Claim Rejections - 35 USC § 112

The Examiner objects to claim 41 in that there is no antecedent basis for the limitation "the displayed speedometer or tachometer scale" in lanes 1-2.

In response, Applicants simply amend claim 41 to depend from claim 31 and incorporate the limitation from claim 40.

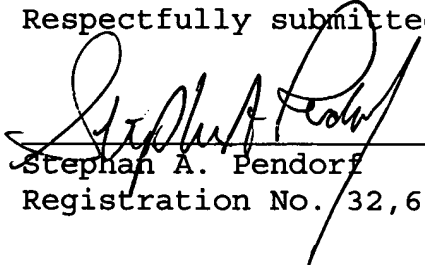


U.S. Application No.: 10/069,647
AMENDMENT A

Attorney Docket: 3926.037

There being no further rejections, early issuance of the Notice of Allowance is respectfully requested. Should the Examiner have any further suggestions, he is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,


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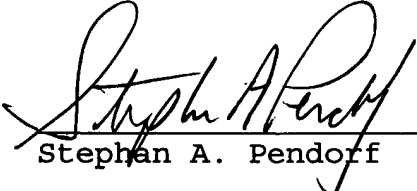
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Dated: **December 22, 2004**

CERTIFICATE OF MAILING AND AUTHORIZATION TO CHARGE

I hereby certify that the foregoing AMENDMENT A for U.S. Application No. 10/069,647 filed May 2, 2004, was deposited in first class U.S. mail, with sufficient postage, addressed: Mail Stop Amendment, Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria, VA 22313-1450, on **December 22, 2004**.

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.


Stephan A. Pendorf